The Bradford Archive

THE PURPOSE OF THIS VOLUME

The 600-odd aerial photos from the Bradford collection that were located in Barri Jones' office at the time of his death, came into our possession not long after we had devised the Tavoliere-Gargano Prehistory Project. This presented us with a double dilemma. The first aspect of the dilemma was how best to make the photos serve the research aims of our project. The decisions we made and the interpretative results are presented in Volume 1 of this publication. The second part of our dilemma was to decide in what form the archive would best serve the interests of the wider scholarly community. We decided that the photos (most of which had never been scanned previously and existed only as prints) should be made as widely available as possible and this is the primary purpose of the present volume and the associated disc. Of course, there is considerable analytical overlap between the two volumes: the mapping of the sites in Volume 2 is central to the work described in Volume 1, while information derived from work in the field is included in the site descriptions in Volume 2. However, in general Volume 1 represents the analytical and interpretative aspects of the project, while Volume 2 represents the archive of the photos and the mapping of the sites.

SDH & RDW

THE BRADFORD ARCHIVE

In the month or so prior to the start of the allied invasion of mainland Italy on the 3rd of September, 1943, the Northwest African Photo Reconnaissance Wing (NAPRW), comprising squadrons from the RAF, the USAAF, the South African and the French air forces, flew more than a thousand sorties over mainland Italy, adding over 300,000 photographic negatives and a million prints to an already significant archive produced during the earlier Sicily campaign (Dengler 2009: 129–30). Along with the invasion beaches, the central focus of these sorties was the many airfields south of Rome from which attacks could be launched against the beaches, including the 13 which made up the so-called Foggia complex, spread across the Tavoliere Plain. These latter were photographed daily (*ibid.*: 131). After the allied occupation, and the reformation of the NAPRW at San Severo/Torre di Giunchi as the Mediterranean Allied Photo Reconnaissance Wing (MAPRW), training flights continued to photograph the Plain, where several of these airfields remained in operation and other new ones were built. It is from these photos that John Bradford, then a photo interpretation officer in the British army Intelligence Corps, selected (and subsequently added to) the photos comprising the 'Bradford Archive'.

With the exception of a series of oblique photos taken by him and Peter Williams-Hunt, the intention of which was to record archaeology, the original purpose of these photos was military, first operations and then training. Of the 600-odd surviving photos from which those presented in this catalogue have been drawn, nearly 200 show airfields, while most others were taken close to them. They are therefore important military historical documents. But they show much else besides. First are the Neolithic enclosures that lie at the heart of the present project (*c.* 400 photos). They also show Iron Age Arpi and Masseria Finizio (16 photos) and there are also numerous ancient roads and field systems. All these show up as vegetation or soil marks. Then there are surface features, such as medieval earthworks (*c.* 80 photos) and post-medieval drove roads, which were still visible when the photos were taken but have since disappeared. Many of these, like the airfields, are still reconstructable in skeletal form from the 1950s *Istituto Geografico Militare* (IGM) maps of the region, and/or *Google Earth*, but they require Bradford's photos to give them flesh.

THE DISPERSAL OF THE PHOTOS

What happened to the bulk of the photos taken by the NAPRW and MAPRW after the war is unclear. No doubt many were simply thrown away, while others were taken home as souvenirs by servicemen (many appear on veterans' websites and on *eBay*). As for those of archaeological interest, Bradford and Williams-Hunt refer to a "selection... which received a Security clearance and was passed for reproduction" (Bradford & Williams-Hunt 1946: 192), Bradford later writing, "The preservation of the photos of the Apulian sites fell to me, and subsequently they were officially transferred to the University of Oxford [the Pitt Rivers Museum]" (Bradford 1957: 89). In fact well over 100,000 images were transferred to the British School at Rome, from which a fraction passed to the Rome *Aerofotoeca*, and the remainder to the Pitt-Rivers Museum. These latter then continued to Keele University and finally to the Royal Commission on the Ancient Monuments of Scotland, Edinburgh (RCHAMS nd.; Radcliffe 2006: 54), where they await georeferencing and cataloguing. When the photos comprising the present collection were extracted is unknown, but most were obviously cherry-picked for the presence of Neolithic sites, presumably by Bradford for inclusion in his missing 'definitive report' on these (Bradford 1957: 86). They do not, however, show all the sites in his and Williams-Hunt's publications, or described later in Barri Jones' *Apulia* (Jones 1987), and it is clear that the dispersal of the archive did not stop there. As stated above, the photos in our possession were found in Jones' office after his death, while a few were acquired later — from Catherine Delano-Smith — as scans.

CONTENT

The archive is very much an archaeological and historical palimpsest. It is not my intention to discuss in detail all the layers comprising this palimpsest, but if we are properly to understand them we need to know a little about the way in which the archive was formed and what it actually shows. The key to this is the archive's historical (as opposed to archaeological) context — the unparalleled density of aerial coverage required by the military, the particular foci of this, the technical limitations imposed by the prevailing wartime conditions (which I will deal with under plotting and scaling), the stage in Italian landscape history when the photographs were taken and, last but not least, the research interests of the man responsible for selecting and preserving them.

One oft repeated myth surrounding the Bradford Archive is that owing to the depredations of post war agriculture, in particular deep ploughing, much of the archaeology visible in it "will not be seen with such clarity again" (Jones 1987: viii). Undoubtedly much archaeology has been destroyed since WW2, in particular that belonging to the medieval period, which when the photos were taken remained upstanding on the surface, but there is little evidence that deep ploughing has significantly impacted on the Neolithic ditched enclosures, the surface archaeology of which was scoured away, perhaps millennia before (see volume 1, chapter***). The real reason why Neolithic enclosures show up so well in the photos comprising the Bradford Archive is the unparalleled intensity of the air photographic coverage from which it was selected. During WW2, photos were taken day after day after day, and when a site was visible, it was captured photographically, whereas since WW2, sites have been photographed only sporadically. It is not surprising therefore that the Bradford Archive includes both many and better images.

What are the implications of this for our understanding of the archaeology shown on it? Does, for example, the known distribution reflect the actual distribution of Neolithic sites on the Plain, and does the form taken by the vegetation marks reflect the totality of what lies underground?

In the Bradford Archive, the densest concentrations of Neolithic sites are around airfields, on which both operational and — we assume — later training flights focussed. By contrast the areas between these, although filled out in places by the surface surveys of Selene Cassano and Alessandra Manfredini (1983), Santo Tinè (1983) and the University of Foggia (Volpe *et al*. 2003) and by photos taken for mapping purposes (Brown 2001–3), have received much less coverage. Even isolated sites, such as La Lamia (J73) and two Bradford sites just across the Ofanto river (and therefore outside our survey area), maintain the association with airfields, whereas parts of the Plain where there were no airfields — because they were too wet or too hilly — remain relatively empty (fig. 1).

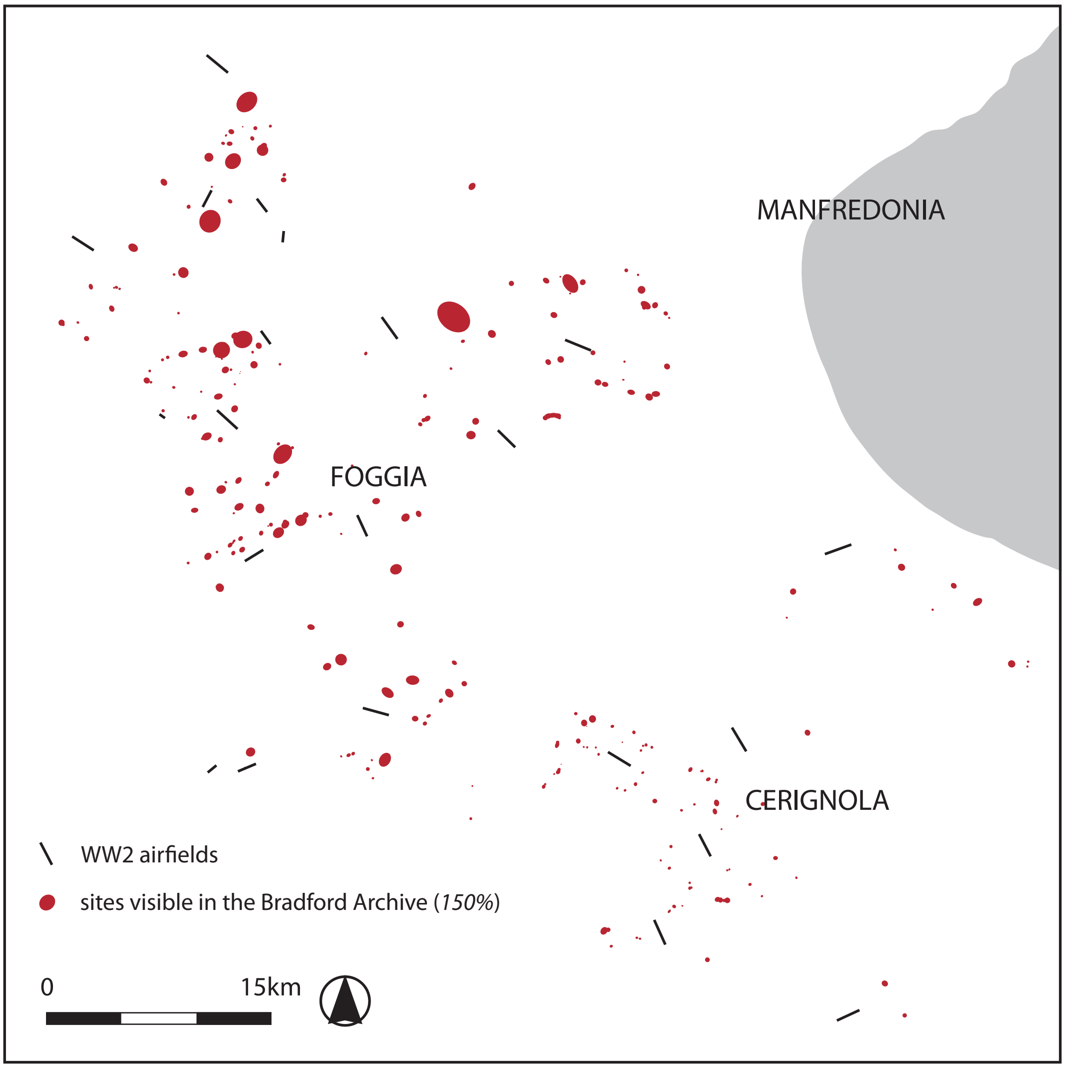


Fig. 1 The distribution of probable Neolithic enclosures visible on photos in the Bradford Archive and the distribution of both axis and allied airfields in the survey area.
The two more or less coincide

In those parts of the Plain well covered by the Bradford Archive, it is unlikely that there will be *many* more discoveries (I emphasise the 'many' because some have already been made), and, to answer the question posed above, the distributions within them probably do reflect something of Neolithic reality. Outside this area, however, the answer is a categorical "No." There were airfields, including San Severo/Torre di Giunchi out of which the reconnaissance squadrons operated, of which there is no coverage in the Bradford Archive, and which to this day remain bereft of sites, and these areas may actually have been empty. Elsewhere there is every reason to believe that there are more — and probably many more — sites to be found.

As for the totality of what lies underground, the answer to the question is also "No." Recent geophysical surveys of several Neolithic sites (Gallo *et al*. 2009; Ciminale *et al*. 2007; Ciminale *et al*. 2009) show much that was not visible from the air — C-ditches, entrance structures, whole enclosures. Moreover, photos of sites visible in the Bradford Archive recently accessed on *Google Earth* show Neolithic features formerly obscured by a medieval motte and bailey (J9), military activity (J20) and olive groves (J39 and J138–9), as well as features which though open during WW2, do not show on any of the photos available to us

(J67). These augmentations were enough to change our classifications of at least three of these sites. It is important therefore to emphasise that though the Bradford Archive is an important and useful survey tool, by itself it tells a very incomplete story.

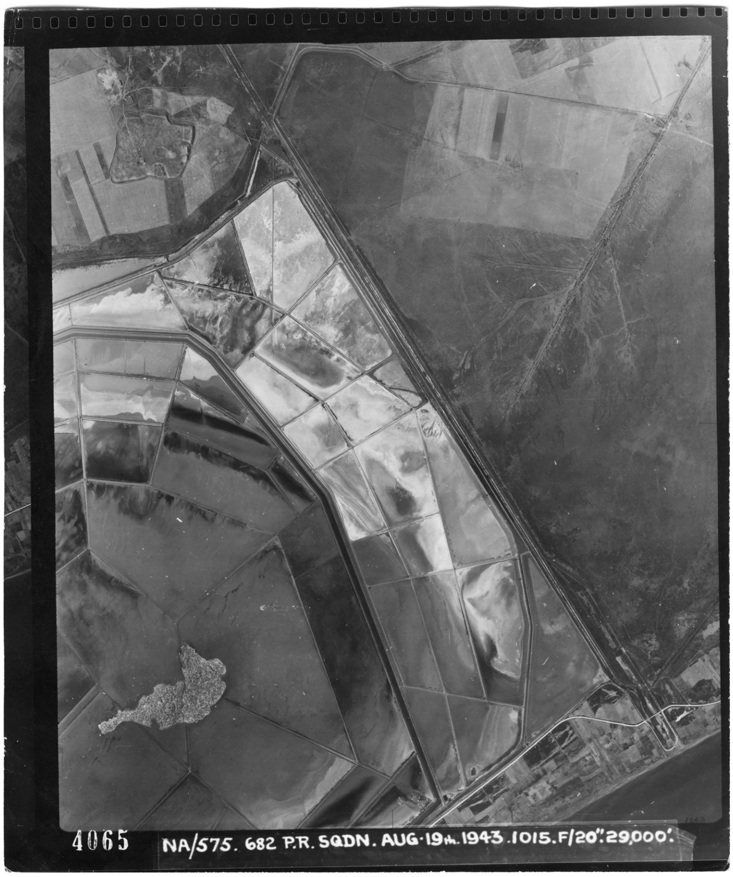


Fig. 2 Photo taken by 682 Squadron, RAF, on the 19th of August, 1943, showing the medieval earthwork of Salpi (top right) and adjacent salt pans. NA/575 designates the run or flight. F/20" is the lens size and 29,000' the nominal altitude from which the photograph was taken. 1015 is presumably a time but it is not clear of what, since widely spaced photographs belonging to a single run show the same time. *Scale 50%*

The Italian landscape and John Bradford's research interests can be dealt with together. It was landscape history that concerned Bradford, who compared its recording to that of archaeological sites where everything is — or everything should be — totally and impartially recorded (Bradford 1957: ix), and it is this that conditioned the selection of photos that he made and that has come down to us. For good or ill, Bradford tried to collect everything. Thus not only do we have photos of prehistoric, classical, medieval and post-medieval sites, we have photos of the landscapes between and around them. Collectively these additional photos provide us with a context in which to understand the Neolithic sites, which is of both practical archaeological, and interpretative use — for example, a record of the wider land use of an area at the time it was photographed (be this agricultural or military) will give us a good idea of the visibility possible within it and the interpretative weight that should be placed on this. In the end, however, not even Bradford was — or could be — totally impartial, and there are clear biases in the archive, not least in favour of Neolithic enclosures, and sites in the vicinity of airfields. Nonetheless the archive as a whole, in showing the landscape as a whole, is a tremendous resource for a wide range of disciplines.

THE APPEARANCE OF THE PHOTOS

Of the original Bradford Archive, the Project had at its disposal 594 aerial photos, most of them original *c.* 7"x8" RAF (fig. 2) and *c.* 9"x9" USAAF contact prints (fig. 3). These comprise mostly individual and short runs of 'vertical' photos, selected from much longer runs taken during operations and training between July 1943 and July 1945. Only two long runs are present. Of Bradford's and Williams-Hunt's oblique photos, only those that have

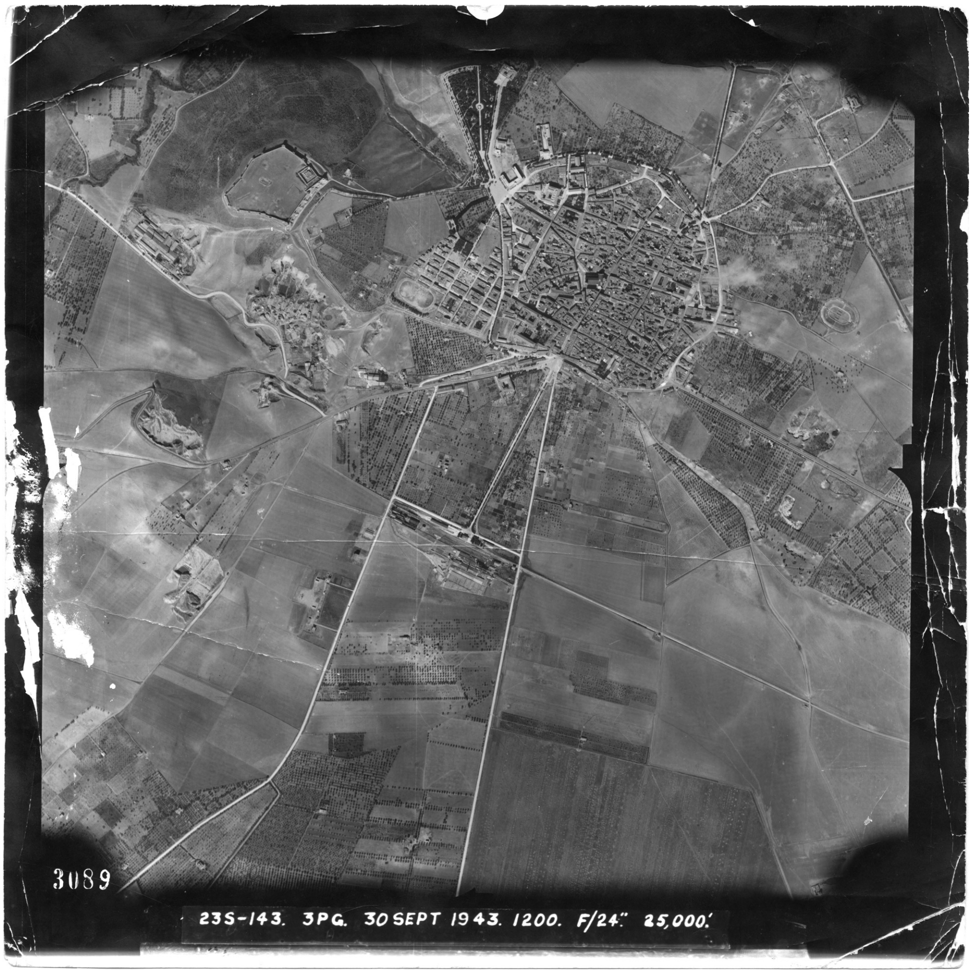


Fig. 3 Photo of Lucera taken by 23rd Photo Reconnaissance Squadron, USAAF, on the 30th of September, 1943. The time recorded is midday, F/24" is the lens size, and 25000' the nominal altitude from which the photograph was taken. *Scale 50%*

been previously published are available (Bradford & Williams-Hunt 1946: pl. 1; Bradford 1957: pls 25–6; Jones 1987: pls 27, 31 & 36).

The quality and condition of the prints ranges from good to very poor. For the most part, the visible flaws result from a lack of care prior to or during printing, rather than poor treatment afterwards. In a few cases camera shake has rendered the photographs unusably fuzzy. Many negatives were scratched and/or dirty; and this shows up on the prints. A few have faded badly, including most of those comprising one of the long runs referred to above (most likely these were 'fixed' for insufficiently long — fig. 4). Others are creased, have fingerprints on them, and/or pencil marks (usually marking an archaeological site but sometimes something of military interest), and most are a little dog-eared (fig. 3). Quite a few have been mutilated by the application of a stick-on scale on the front and different glues (masking tape, blue tack, etc.) on the back that have stuck to the fronts of others. Perhaps half have a high contrast, which shows the vegetation marks captured on them to advantage, but many others are flat, probably because the negatives from which they were made were underexposed in the camera. Where the quality of the printing is good, however, owing to the large size of the original negatives, image resolution is almost always good as well, and a considerable degree of magnification is possible.

Each photo is uniquely designated by a combination of photo number, run code and squadron number, the latter usually forming part of the run code (e.g. '3026 NA/577.682 P.R.SQDN' or '3008 23S-82.23 Sqdn'). It also has a date, the lens size used (expressed as focal length in inches — e.g. F20"), the time the photograph (or run of photos) was taken (e.g. 1700) and the altitude in feet at which it was taken, the latter ranging between 5000'

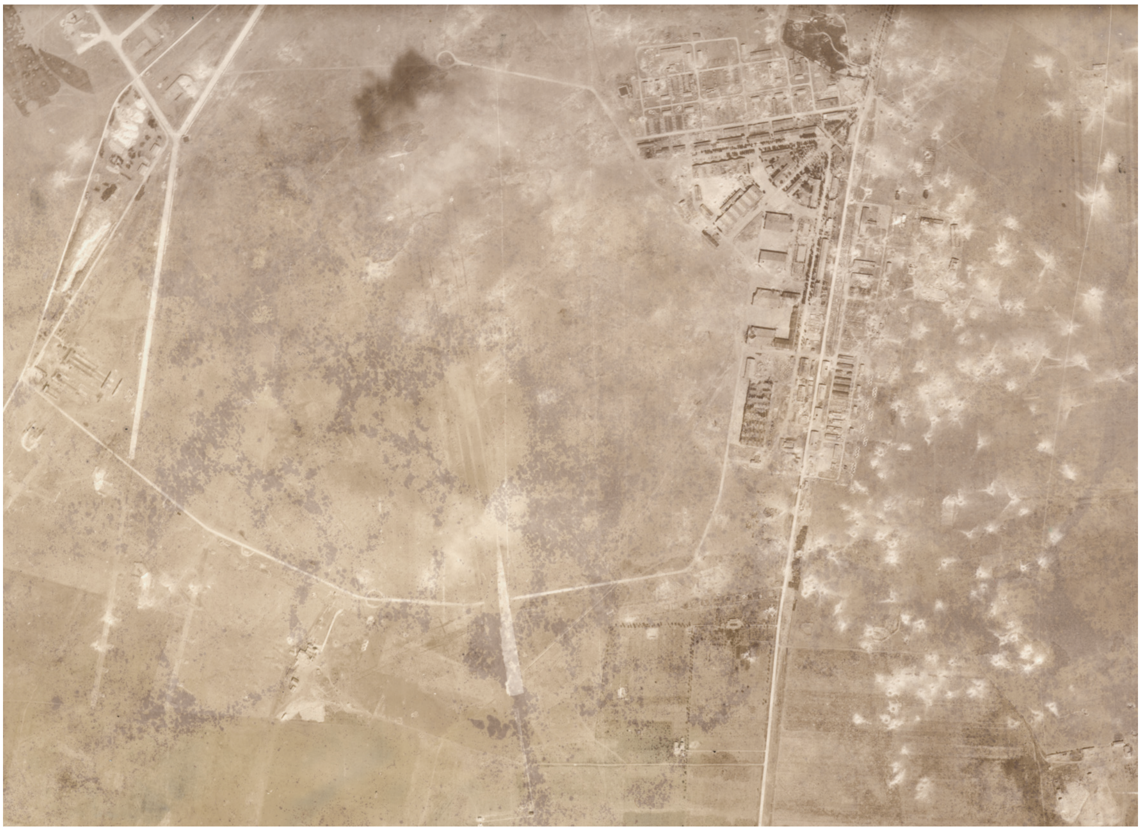


Fig. 4 Missed! One of a run of 86 photographs taken between San Lorenzo, just south of Foggia, and San Severo on the 7th of September, 1943. This very degraded photograph shows a cluster of bomb craters to the west of Foggia Main airfield and the apparently undamaged runway. *Scale 100%*

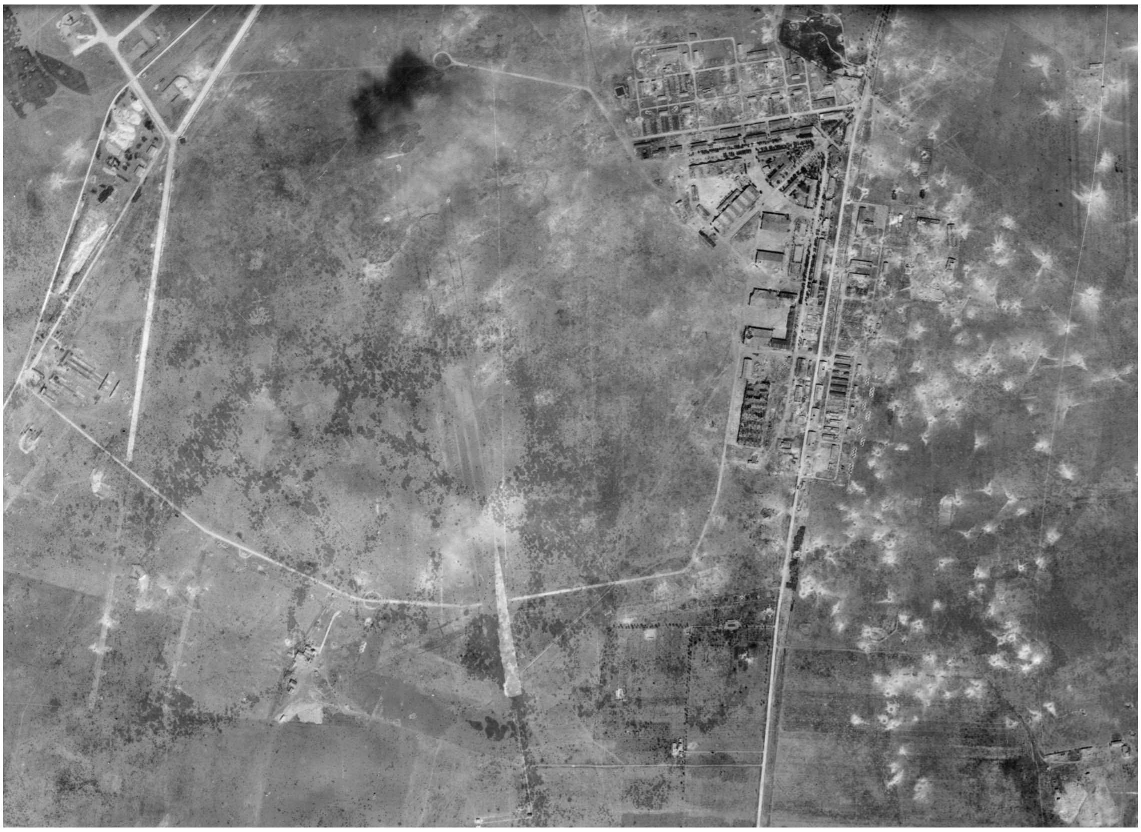


Fig. 5 Foggia Main again. Although much of the detail has been lost for good, some of it can be brought back by returning the print's bleached sepia to black and white. *Scale 100%*

and 30000'. Not surprisingly operational photos tended to be taken at high altitudes with long lenses, whereas the reverse is sometimes true of training and/or test photos. Finally some say "Confidential" or "Secret", or have a rectangular cut out of the corner, from which this designation had been removed (perhaps the 'cleared' photos referred to by Bradford and Williams-Hunt). All of these notations were applied as 'negative stencils' and form part of the photographic print (figs 2 & 3).

OWNERSHIP

Crown copyright of photos expires 50 years after their *creation* and thus the RAF photos are out of copyright (Noakes 2012), while the USAAF photos, as works prepared by officers or employees of the U.S. government as part of their official duties, and no longer classified, are considered to be 'in the public domain'. Copyright therefore is more a question of possession than right, for whereas the original images comprising the archive are not copyright, copyright can be claimed for copies and edits, digital or otherwise, made of or to these. It follows therefore that copyright of the photos presented here, both in Volumes 1 and 2 and on the associated disc, is ours. Provided that we are properly acknowledged, however, colleagues wishing to use them for accademic purposes are welcome to do so free of charge.

PLOTTING AND SCALING

The key to the success of the Mass Survey and our experiments with Phenomenological Site Catchment Analysis (PSCA) is the accurate plotting on the ground of the vegetation marks visible in the aerial photos, the graphic and textual by-product of which comprises this volume. In those cases where the configuration of a site in which we are interested is not unambiguously Neolithic, how can we be sure that it is a Neolithic one, if we have not been there and found artefactual evidence for Neolithic activity? And how then can we assess the relationship between a ditch, say, and a topographic break if we do not know within a few tens of metres where the ditch is?

Prior to the commencement of the Tavoliere-Gargano Prehistory Project, the principal source for the locations of Neolithic sites in the Tavoliere was Jones's *Apulia* (1987), but the mapping in this is both inconsistent and for our purposes, hopelessly schematic. We had therefore to begin from scratch. Eschewing the method of obtaining a scale advocated by Jones, which, clearly does not answer our needs, the method that we have adopted in mapping vegetation marks is conditioned by the nature of the archive itself, which is both incomplete and of variable quality for photo interpretation and mapping. That our method took us to nearly 140 different Neolithic findspots and exposed Neolithic ditch sections at seven different sites has proved its efficacy beyond doubt.

In accurately mapping the Neolithic sites captured, three problems faced us — in part the consequence of the photos' selection and in part their nature.

Problem number one relates to geographical location. From the start we knew where some of the areas shown in the photos were located — they had been mapped by previous workers or showed distinct or well-known archaeological sites. But many others had not been located geographically. These we had to match up with the extant 1950s IGM 1:25000 maps or with other photographs, whose location had been previously established. The key features used were settlements, from large towns like Foggia to tiny farm buildings, road junctions, WW2 airfields, railways, watercourses and bridges, many of which did not change significantly between the time the photos were taken and the IGM maps drawn. Towards the end of the project, we also began to use *Google Earth*, matching what was visible in the Bradford Archive to the changing coverage available on line. For the most part we were successful.

Problem number two arose when we began trying to work out the scale of the photos. Bradford (1957: 57–9) and Jones (1987: 30) suggest dividing the altitude at which the photo was taken by the focal length of the lens used, thus: [1]

$$\text{Scale} = \frac{\underline{\text{Altitude x 12}}}{\text{camera focal length in inches}}$$

It is axiomatic, however, that the scale of a vertical photograph decreases towards its edge, since the distance between the ground photographed and the camera's lens increases towards its edge (think of the way a tall building photographed from below is distorted). Likewise differences in scale result from differences in ground elevation. However our main difficulty was that the angle at which the photographs were taken was not always exactly vertical. Bradford thought that this did not matter — across most sites the error introduced will be less than it is possible for us to plot anyway (a pencil mark on a 1:25000 map may be 10m wide). However across a small-scale photograph (one taken from a high level or using a lens with a short focal length) the error resulting from even a slight tilt can be considerable. For example, in one nominally1:16800 photograph (of the Posta d'Inanzi area — see sites J193, A228 and A231), the error is close to 200m, more than enough to put a small basic site in the wrong place. Up to a point we should be able to correct such photographs, although this itself involves some distortion, but in this and in a few other cases a changed road layout made it impossible to work out the orientation of the tilt and therefore that along which the correction needed to be made.

In addition, the altimeters in use during the World War II were aneroid barometers, which, to read altitude accurately, had to be set to the prevailing atmospheric pressure, and altitudes recorded over enemy territory where this was not know for sure may be wrong (Kimble & Bush 1943: 43).

The third main problem arises from the fact that the photographs were taken at different times of year. Only after the close of the war in Europe, in 1945, were photos taken that deliberately targeted the archaeology (mostly during May and June, both good months for aerial photography in the region). But the Bradford Archive incorporates many earlier training and operational photos taken at other, less favourable times of year. The vegetation marks therefore are of a variety of types and qualities. In part this is a good thing. Features may show up as weeds in stubble, for example, which did not show up well or were not photographed as cropmarks in cereal crops. Cava Petrilli (site J4), discussed in volume 1, is a case in point. But the corollary is that many of the photographs are not that good. Surviving pictures of the Tavernola complex (site J173), for example, taken rather sooner after the cereal harvest than Cava Petrilli, hardly show any features at all.

Our principal method of scaling and plotting aerial photos was worked out in the field on discovering just how inaccurate Jones' plotting was. The first step, also referred to by Bradford (1957: 57, note 2), is to find a distance that is present on both the 1:25000 maps and an aerial photo, measuring it on the map with a scale rule (M_1) and on the photograph in millimetres (P_1). The measurement on the map is then divided by the measurement on the photograph. This gives us the distance in metres of 1mm on the photograph. As Bradford suggests, it is best to repeat this on several different orientations and obtain an average: this is effectively our scale (S). (If the results on different orientations are markedly different, this probably means that the aerial photograph is not dead vertical, which often proved to be the case). We then measure in millimetres the distance between a point present on both the map and the photograph and a point in the site (P_2), multiplying this by the effective scale (S). This gives us the distance in metres of the measurement on the photograph, which, using the scale rule again, we can then measure onto the map (M_2). And so on… For a scale in kilometres, which is needed to scale the photographs to a common size, it is necessary to divide 1 by the effective scale (S) and multiply by 1000.

In practice this whole process was not as easy as it sounds. There were not always points common both to the maps and the aerial photographs — particularly on large scale photos (one taken from a low altitude or using a lens with a long focal length). To accommodate for

$$\frac{M_1}{P_1} = S \qquad P_2 \times S = M_2 \qquad \frac{1}{S} \times 1000 = 1\text{km}$$

differences in scale, resulting from slight tilts in the photographs etc., measurements had to be taken again and again.

For the present volume we shrunk scans of the aerial photos directly onto scans of the IGM 1:25000 maps, scaled-up to 1:12500, using the layers function in *Photoshop* (Version 8). The resulting composites were then placed in *Illustrator* (CS) and the sites and contours on them traced using the pen and pencil tools. This is time-consuming but well suited to sites such as the Tavernola complex and Passo di Corvo (J173 and J198), which are so complex that they can only really be traced. Irrespective of the method used, the scales of the vegetation marks plotted may, in some instances, be slightly different, but provided the photos are not too oblique or the sites too widely peripheral to the point on the photograph for which the scale was calculated they will be *more or less* in the right place, the primary concern when working on the ground. In practice, when tested against available *Google Earth* images of sites measured or overlain in the same ways, the difference between them was in almost all cases minimal.

But why *this* method? Why not just overlie the aerial photographs on a digital map and orthorectify them using a GIS computer program? The simple answer to this is that digital as opposed to paper maps of the Tavoliere at the necessary 1:25000 scale were not available at the start of the project. In addition, however, our method had the merit of combining mapping with interpretation; and, as Bradford himself emphasised, "In photo interpretation, an experienced eye is of far greater value than elaborate equipment" (Bradford 1957: 62). As we pored over the photographs comprising the archive, we learned an enormous amount about them, the vegetation marks, and the landscape in which they were located, which we would not have learned, had the whole process been carried out on a computer. Anyway, where we could not plot a photo accurately, it was always because it did not show sufficient features for us to locate it, and this would have been as great an impediment using GIS. Indeed the human eye can adapt to and improve on inadequate maps in a way that GIS cannot. The accuracy obtained and the usefulness of our results therefore are as good as if not better than that possible using GIS — at least that is our opinion.

SCANNING AND ENHANCING THE ARCHIVE

It was always our intention to scan the archive. In addition to backing it up in an easily reproducible and communicable form, the scanning process assisted us in three ways. Degraded black and white photographs scan to advantage, the return of the bleached sepia colour to black and white often revealing much that appears lost to the naked eye (fig. 5). It also enabled us to enlarge them and to search for features more easily than with the naked eye or with a magnifying glass. And using *Photoshop*, we could enhance vegetation marks (using the burn and dodge tools and the curves, colour balance and brightness/ contrast functions), scale the photos to a common size, merge them where necessary and overlie them on scans of the IGM 1:25000 mapping, all of which we needed to do to produce the images in the present volume. An image resolution of 400dpi proved good enough for vegetation marks at all scales, and small enough to manipulate quickly on the computer, whilst on photographs with a nominal 1:6000 scale (the largest in the archive) 1200dpi would show detail as fine as aircraft markings and vehicle tracks.

THE CATALOGUE

The catalogue that follows includes all the Neolithic and possible Neolithic enclosures visible in the extant archive, except for a handful of sites, the photos of which are too faint, too confused or too incomplete to be meaningfully reproduced. For the remainder, the best available photo or photos (sometimes as a composite of more than one) have been enlarged to a common 1:5000 scale, and digital traces of these and any other available photos combined in a 1:12500 site/area plan, showing the site and any immediately associated sites. This is combined with a text box giving the area, the IGM 1:25000 map sheet on which the site falls, its approximate central grid reference (to 10 metres), the local topography *as it appeared to our survey teams on the ground*, the form taken by the visible vegetation marks, our and (where available) Jones' classifications of the site, a summary of the finds made by us and/or previous workers, the nature of any previous ground based fieldwork and any associated bibliographic references. For selected sites, we have also included further enlargements of key features visible on the aerial photos, some smaller scale overviews, photos showing the site as it appears on the ground today and photos of pottery and other finds made by us. We have also included Bradford and Williams-Hunt's previously published oblique photos. Throughout captions are kept to a minimum. For the photos, the captions consist primarily of site names, the date the photo was taken, mention of any special and/or unclear features and such detail as is necessary to orientate the reader within or in relation to the site; and for the plans, acknowledgment of the sources of the images upon which they are based.

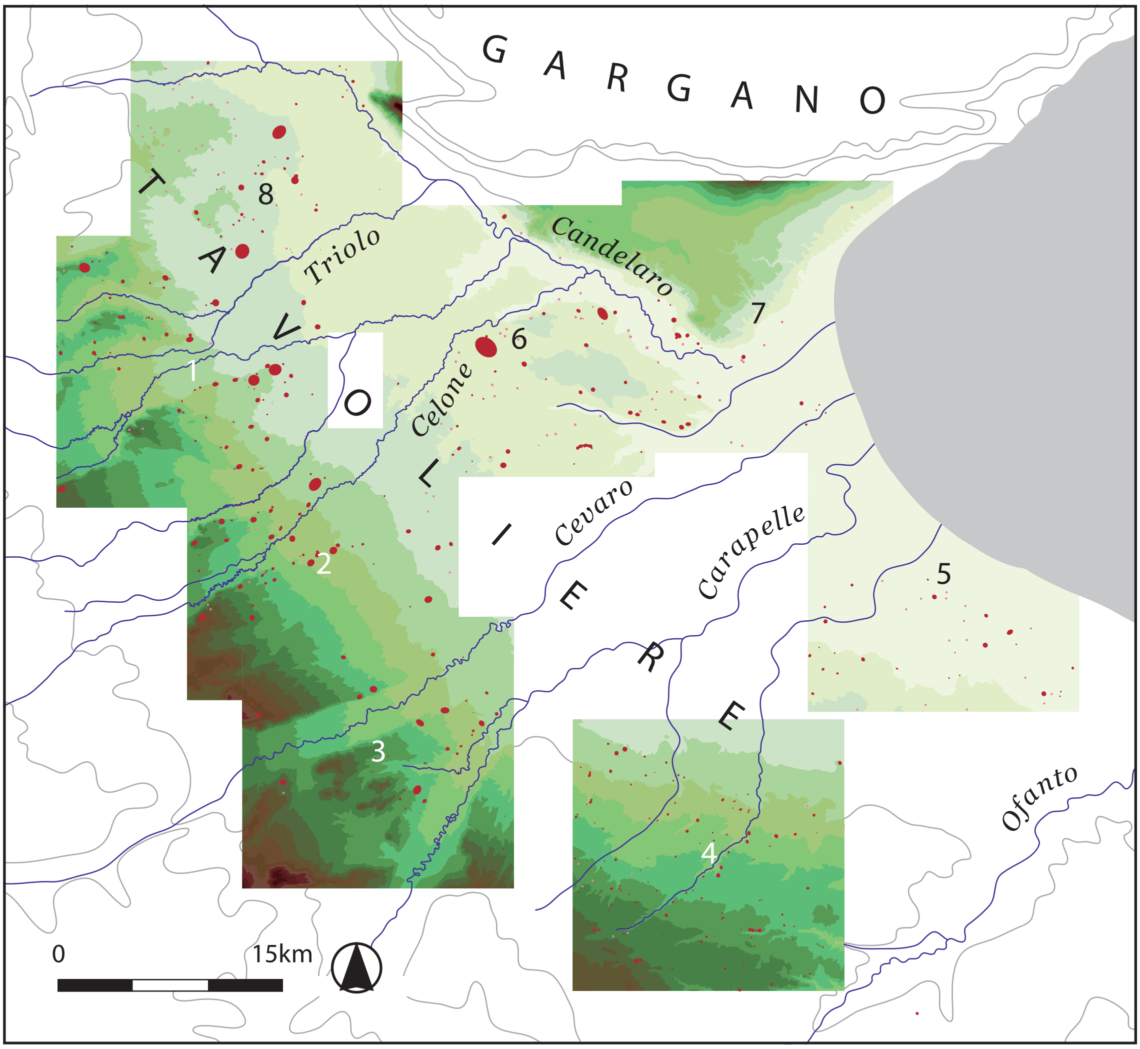


Fig. 6 The catalogue is divided into eight regional zones: Lucera (1); Upper Celone/Foggia southwest (2); Upper Cervaro/Castelluccio (3); Cerignola west (4); Lago Salpi/Zapponetta south (5); Lower Celone/Foggia northeast (6); Lower Candelaro/Manfredonia southwest (7); and San Severo (8)

Sites are grouped according to where they lie on the Plain. For the purposes of the catalogue, eight areas have been separated out (fig. 6), which, following Jones' numbering of sites in his catalogue — which is retained — circle the Plain in an anticlockwise direction, beginning with the area immediately north and east of Lucera (1), continuing southeast into the upper Celone/Foggia southwest (2), upper Cervaro/Castelluccio (3) and Cerignola west regions (4), then northeast to Lago Salpi/Zapponeta south (5), northwest to lower

Celone/Foggia northeast (6) and lower Candelaro (7), and finally northwest to San Severo (8). For each of these there is a map showing *all* the known Neolithic or possible Neolithic sites within it (figs 10, 12, 14, 16, 18, 20 and 22–3), on which new sites identified by us, either from photos in the Bradford Archive or from other sources (such as *Google Earth*), and sites identified by other workers are numbered consecutively from left to right (A1–308 and G1–14). (G1–14 were last minute identifications from *Google Earth* — after G14, I stopped looking). There are also brief textual summaries of which sites are, and which sites are not included in the main catalogue and why, the nature of the local topography, the distribution of sites and the nature of the Neolithic architecture comprising them. Finally each section is rounded off with a correspondence table listing all the sites shown on the map, which site comes from what source, and any previously published number or name.

SITE CLASSIFICATION

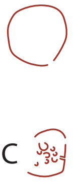
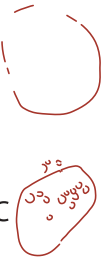
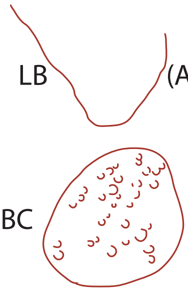
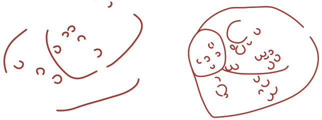
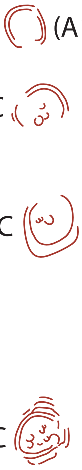
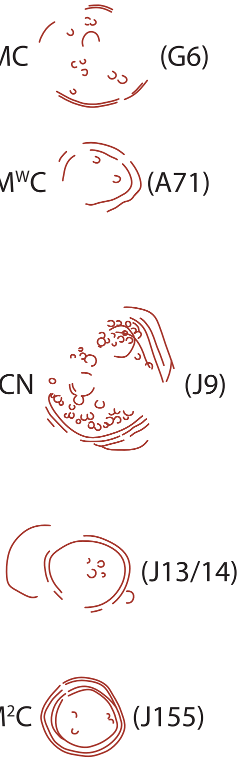
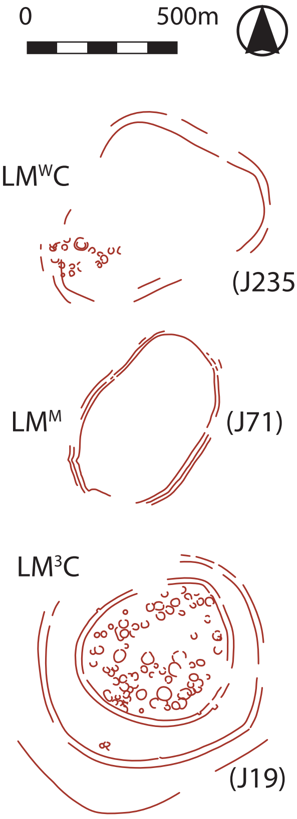
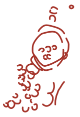
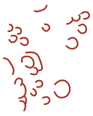
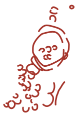
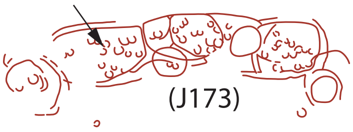
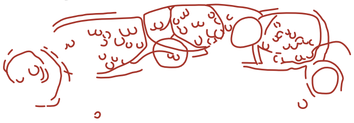
The classification by type of the sites in the catalogue has proved far from straightforward and requires some comment. Sites can be classified by size, shape, the number of ditches comprising them, the way these are grouped, entrance type, position in the landscape, relationship to other sites (single or group), the presence or absence of C-ditches and/or nuclei (internal enclosures the size of a small enclosure), or any combination of these things. Use insufficient of these criteria and we end up grouping very different sites; use too many and every site ends up with a classification of its own. But it is important to make the attempt because of the potential implications of such differences in terms of date, site function, regional culture and so on.

In practice the easiest and the most practically useful way of classifying them is to use a variety of different classifications, each designed to suit a particular research need. This is what we, and Jones before us did when we considered the orientation of the openings in C-ditches (Jones 1987: 189–90), it is what we have done in sorting sites by different categories in the Mass Survey (volume 1, chapter**), it is what Andy Dufton did when he sorted sites in terms of their orientation in the landscape (volume 1, chapter **) and it is what Keri Brown was doing when she recognised a discrete category of large sites north of the Cervaro (Brown 2001–3: 139–43). And it is how our classification works.

Sites are first separated into small (S), intermediate (I) and large (L) (less than 250 metres across, between 250 and 500 metres across and more than 500 metres across), then by the number of ditches comprising them (B for a single basic enclosure, M for a multiple — e.g. SB or SM), then by the way these are configured, as a single ditch or single closely spaced pair of ditches (no additional notation), a single widely-spaced pair of ditches (e.g. IM^{W}), a single set of ditches comprising more than two ditches (e.g. IM^{M}), or as several discrete individual or sets of ditches (e.g. IB^{2} or LM^{3}) (see fig. 7, opposite). (For the purposes of classification, we have ignored eccentricity and concentricity, because in most cases — where it is possible to tell — both individual and sets of ditches spring eccentrically from other individual or sets of ditches). Sites with visible C-ditches and/or nuclei are also distinguished (e.g. IMC or IMCN), while we have accommodated the fact that many individual enclosures form part of an adjoining group, either by adding a G to the end of the classification of the individual enclosure (e.g. IMCG) or by grouping them together as intermediate or large groups (IG or LG). Thus an IM, an IM^{W}, an IM^{2}CN and an IMG site, or a SBC and a LM^{3}CN site, *are both individual types and part of one or more larger groups*, in this case the I and IM groups, and the C group.

Most enclosures in the catalogue are either small single-ditched (SB) or intermediate double or multiple-ditched (IM). There are, however, distinct variations within and around these two broad types that stand out regionally, as unusually common or unusually rare.

Fig. 7 (opposite) The classification of Tavoliere Neolithic ditched enclosures used in the catalogue

	Small **<250m**	**Intermediate** **250–500m**	**Large** **>500m**
Basic	 SB (A134) SB (J191) SBC (J53)	 IB (J60) IBC (J43)	 LB (A68) LBC (J50)
Basic multiple		 IB^{2}C (J8) IB^{3}CN (J40)	
Multiple	 SM (A128) SMC (J72) SM^{W}C (J51) SM^{M}C (A93)	 IMC (G6) IM^{W}C (A71) IM^{M}CN (J9) IM^{2}C (J13/14) IM^{2}C (J155)	 0 500m LM^{W}C (J235) LM^M (J71) LM^{3}C (J19)
Open	 SOCG (J77)	 IOC (J73)	
Groups	 SMCG (J77)	 IMCG (J173)	 LG

Examples include the northern concentration of large sites referred to above and, less obvious concentrations of small and intermediate sites with pairs of widely spaced ditches (SM^W and IM^W) along the Celone, and of small sites (SB and SM) and — possibly — of small to intermediate sites with a single set of more than two ditches ($S–IM^M$) in the Cerignola west area. Thus the classification *appears* to reveal both a Tavoliere Neolithic norm and a degree of regional differentiation.

CRITIQUE

In reading through the lists of Neolithic sites compiled by Brown (2001–3), Dufton (volume 1), Jones (1987) and Tinè (1983), I encountered numerous mistakes — map reference inverted or simply wrongly measured, sites placed on the wrong map sheet or folio, previously recognised sites presented as new sites, and so on. For this volume, I have done my best to correct these. However, I am aware that I have made mistakes of my own. Obviously I regret and acknowledge full responsibility for these but like my predecessors I have found it impossible to juggle so many figures, so many sites and so many classifications without making mistakes. It is the inevitable price of constructing a volume such as this.

Another possible criticism is lack of precision. Our grid references are to the nearest 10m, which we regard as a) as accurate as can be achieved in the light of the issues discussed above and b) accurate enough for the purposes of the project. Certainly some features are not very accurately plotted, owing to the distortion of the original photos and a lack of visible features on them with which to tie them to the extant IGM maps, but in every case our grid reference (unless it is one of the inevitable typos) will get the reader to the site and in *most* cases a grid reference measured off our maps will get him or her to a C-ditch.

Finally there is the question of the subjectivity embedded in our identification of what is and what is not a Neolithic site, our reconstructions, our classifications and our assessments of what is important to include in the catalogue and what is not. Here, in fact, I agree with the criticism. Why should our assessment of where the dividing line between these things falls be better than anyone else's, assuming they are informed as well or better than us? Besides which vegetation marks do not show everything, and what they do show, changes from season to season. But a line has to be drawn somewhere. If we have drawn it in the wrong place (and possibly even in the right place) our colleagues will rub it out soon enough. But if it is in the right place it may form part of a new, better picture of the Italian Neolithic.

CONCLUSION

The obvious next steps in the study of the Bradford Archive are: firstly, cataloguing the archaeology and history of the *other* periods represented in it, in particular the well-represented medieval and recent periods (e.g. fig. 8). Secondly, proper cataloguing and georeferencing of the NAPRW and MAPRW photos in Rome and Edinburgh, and a search in these for the photos alluded to in Jones but missing from the present archive. And thirdly, the free dissemination of these to the interested public, perhaps via a website. This would bring us closer — within a dog's barking distance perhaps — to John Bradford's ideal of total recording, and, for the Tavoliere Plain, the thorough understanding of landscape history he believed would follow from it. All this of course is beyond the scope of the present volume, but in cataloguing its Neolithic, it has at the very least demonstrated the archive's potential, and how a start might be made towards realising this. However, as Bradford acknowledged, the spirit of place that lies at the heart of our understanding of landscape, will not be found in the collation and quantification of data alone, however necessary, but in a more 'human equation', the framing and answering of which must be the *next* obvious step. For this the reader is directed to volume 1.

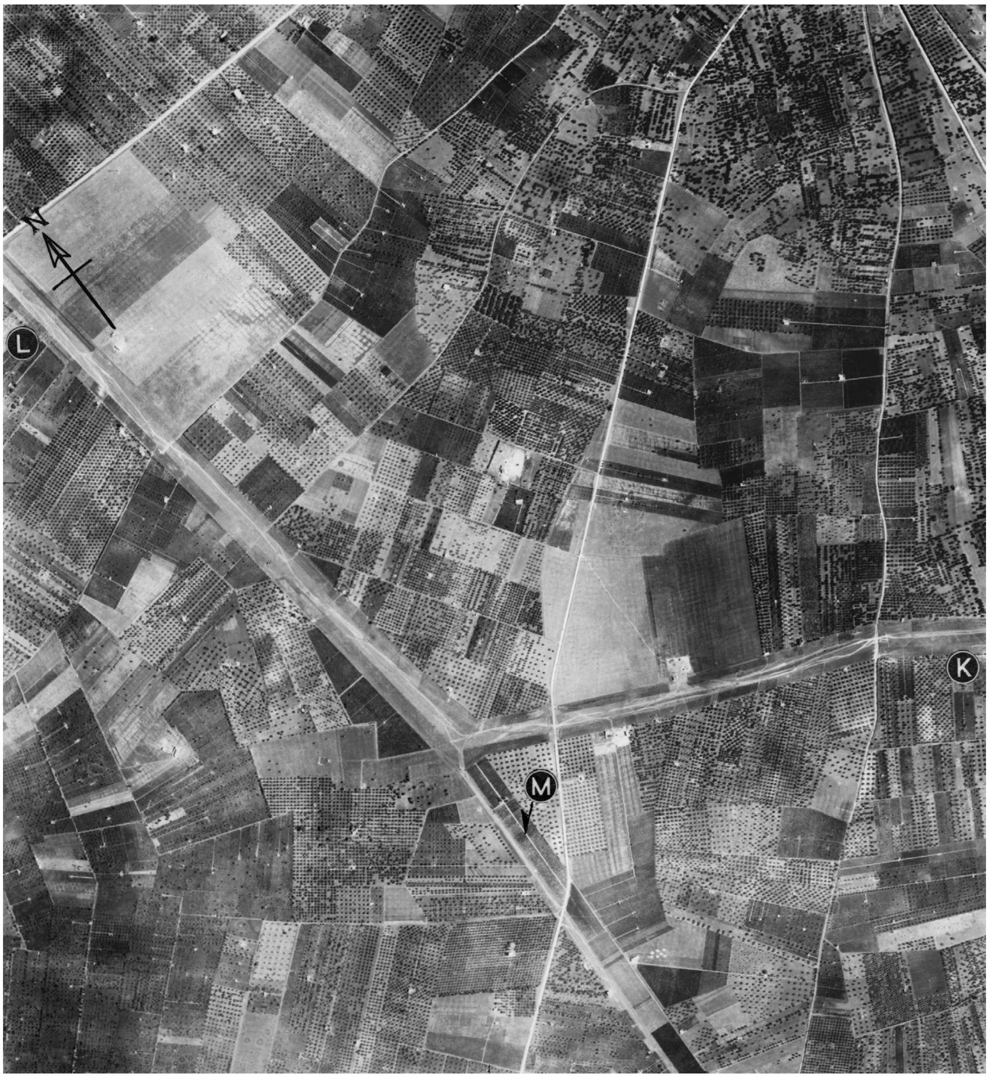


Fig. 8 Unused plate prepared by Bradford of the junction between two post-medieval drove roads or *tratturi* west of San Severo. An associated legend reads “K–L = *tratturo* still open, but halved; M = *tratturo* nearly closed by cultivation of vines”

NOTE

1. Both Bradford and Jones inverted this formula, putting focal length over altitude, but it is clear from Bradford’s calculations in *Ancient Landscapes* what was intended.

KEY TO THE CATALOGUE

Regional maps

●	Neolithic enclosure (typologically Neolithic and/or Neolithic finds yielding)
⬤	Possible Neolithic enclosure
•	Neolithic findspot (no *known* enclosure)
J15	Jones site
A19	Other (*altri*) site
G2	Last minute enclosure identifications off *Google Earth*
┌ - - -	Overlap with adjacent regional map(s)

Site maps

	Vegetation marks with (occasional) additions from geophysical survey — probable and possible Neolithic sites (site G12 shown)
	Vegetation marks — probable later sites (site J23 shown)
J204/A92	Enclosure numbers — Jones sites/other sites
A25 / finds	Numbered Neolithic findspot/unnumbered Neolthic findspot

Text box (Neolithic pottery)

PB	Plain burnished ware	Q	La Quercia ware
I	Impressed ware	PC	Passo di Corvo ware
F	*Figulina*		

Correspondence tables

M22	Tavoliere Gargano Prehistory project field survey number (superceded)
PCV	*Progetto Valle del Celone* (Celone Valley Project) survey site